

## CLAMP FOR WINGED NEEDLE

### Technical Field of the Invention

5           The present invention relates to a clamp to be placed  
and used on a tube of a winged needle used mainly for  
hemodialysis.

### Background of the Invention

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After a medical puncture needle is used, it is  
recapped for protecting the pointed tip of the needle.  
There is a recognized problem in that medical personnel  
are accidentally injured during this operation, which  
can result in infection with AIDS, hepatitis, and so on.  
Various measures have been taken to solve this problem  
so far, and for a winged needle, for example, technologies  
to dispose a protector slidably on the tube (see Japanese  
Patent Publication No.2673682) or to connect a needle  
cannula supporting portion and a protector by a flexible  
connecting portion and bend the connecting portion to  
cover the protector on the needle cannula after use (see  
Japanese Patent Publication No. 2813886) have been  
developed.

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On the other hand, in case of a winged needle to be used for hemodialysis, a clamp for temporarily blocking a flow path in a tube is disposed on the tube in order to prevent blood from blowing out at the time of connection  
5 of the blood circuit, for example.

Therefore, in the case of a winged needle to be used for hemodialysis, two members, that is, a protector and a clamp are necessary for preventing accidental pricking  
10 and blow-out of blood, which disadvantageously results in an increase in cost and complex operations for medical personnel.

The present invention is intended to solve the above-described problems, and the object of the present  
15 invention is to provide a member having a function as a protector and a function as a clamp, that is, a clamp for a winged needle with which is not necessary to perform a recapping operation.

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#### Summary of the Invention

After dedicated studies to achieve the above-described object, the inventors found that a clamp  
25 for winged needles having a function as a protector can

be obtained by providing an upper member or a lower member of the clamp with a space for storing the needle and a hub to allow the needle and the hub to be introduced therein after use, and reached the present invention.

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Therefore, the present invention is a clamp for a winged needle comprising a flexible curved portion on a proximal side having a tube insertion hole, an upper member and a lower member connected via the curved portion, the upper member and the lower member being capable of being detachably engaged at the distal ends thereof so that the tube is pressurized when the upper member and the lower member are engaged, and characterized in that a clearance through which at least the wing can be introduced is generated between the upper member and the lower member when not engaged, and a space for storing the needle and the hub is provided in the upper member or the lower member.

20 Preferably, a pair of left and right engaging hooks is provided on the upper member and an engaged portion that engages the engaging hooks is provided on the lower member.

25 Brief Description of the Drawings

Fig. 1 is a perspective view showing an embodiment of the clamp for winged needles of the present invention.

5 Fig. 2 is an explanatory drawing showing a state in which the clamp for winged needles shown in Fig. 1 is disposed on the tube of the winged needle.

10 Fig. 3 is a longitudinal cross section of the clamp for winged needles shown in Fig. 2 showing a state of pressurizing the tube of the winged needle.

15 Fig. 4 is a longitudinal cross section of the clamp for winged needles shown in Fig. 2 showing a state of being slid to the position where the needle of the winged needle is stored.

20 Fig. 5 is a longitudinal cross section showing a state in which the hub of the winged needle is fixed by the clamp for winged needles shown in Fig. 4.

#### Detailed Description of the Invention

25 An embodiment of the present invention is illustrated in the drawings. The winged needle comprises

a needle cannula, a hub with a wing, and a tube.

Fig. 1 is a perspective view showing an embodiment of the present invention. The clamp for the winged needle of the present invention comprises a flexible curved portion 1 on the proximal side having a tube insertion hole 11, and an upper member 2 and a lower member 3 connected via the curved portion 1, so that the upper member 2 and the lower member 3 can be detachably engaged on the distal sides thereof. When the upper member 2 and the lower member 3 are engaged, the tube is pressurized, and when they are not engaged, a clearance through which at least the wing can be introduced is generated between the upper member 2 and the lower member 3. A space is provided for storing the needle and the hub on the upper member 2 or in the lower member 3.

The curved portion 1 is a flexible member for connecting the upper member 2 and the lower member 3. In this embodiment, the curved portion 1, the upper member 2, and the lower member 3 are formed integrally of a synthetic resin such as polystyrene, polycarbonate, polypropylene, polyethylene, or the like. The curved portion 1 comprises a tube insertion hole 11, and the clamp for a winged needle of the present invention is

used with the tube inserted through the tube insertion hole 11. Though the extent of the curvature in this embodiment is such that the upper member 2 and the lower member 3 are situated more or less in parallel, the angle  
5 formed by these members may be as much as 30 degrees.

The upper member 2 is provided with a pair of left and right engaging hooks 21 on the distal end thereof, a pressurizing portion 22 for pressurizing, or squeezing,  
10 the tube on the proximal side from the engaging hooks 21, and a hub fixing means 23 for fixing the stored hub on the proximal side of the pressurizing portion 22.

The pair of left and right engaging hooks 21 is separated by a distance larger than the outer diameter of the tube so that the tube can be inserted there between, and are hooked at the tip so as to engage the engaged portion 31 formed on the lower member 3 described later. When the engaging hooks 21 and the engaged portion 31  
15 are not engaged, a clearance through which at least the wing can be introduced is produced. The engaging hook 21 is inclined from the distal side toward the proximal side so that the wing of the winged needle can easily be introduced even when the clearance generated between  
20 the engaging hooks 21 and the engaged portion 31 is small  
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as in this embodiment. It is also possible to provide a grip portion 24 on the engaging hooks 21 in order to facilitate the operation of releasing the engagement between the engaging hooks 21 and the engaged portion  
5 31.

The pressurizing portion 22 is provided for pressurizing, or closing, the tube when the engaging hooks 21 and the engaged portion 31 are engaged, and is formed  
10 in a laterally extending angle in longitudinal cross section. The shape is not limited as far as the pressurizing portion can pressurize the tube. It is also possible to provide the engaging hooks 21 on the lower member 3 and the pressurizing portion 22 on the lower  
15 member 3 as long as the tube is not pressurized when the engaging hooks 21 and the engaged portion 31 are not engaged.

The hub fixing means 23 is a projection that comes  
20 into contact with the hub to prevent the stored needle from dropping out when the needle and the hub are stored in the storing space 32 on the lower member 3 described below and the engaging hooks 21 and the engaged portion 31 are engaged, and is recessed at the portion that comes  
25 into contact with the hub to as to mate with the shape

of the cylindrical hub. Since the inner wall 26 (see Fig. 3) of the lower member 3 is gently inclined in a right upper direction in this embodiment, even when the hub fixing means 23 is formed into a small configuration, it can sufficiently fix the hub. When the lower member 3 is not inclined, the configuration of the hub fixing means 23 may be made larger without problem as long as the tube is not pressurized when the engaging hooks 21 and the engaged portion 31 are not engaged. The hub fixing means 23 may be omitted if there is no risk that the needle will drop out and injure a finger.

The lower member 3 is provided with the engaged portion 31 on the distal side thereof, and a storing space 32 on the proximal side from the engaged portion 31.

The engaged portion 31 is constructed of a pair of left and the right notches chipped away from both sides so as to engage with the engaging hooks 21 on the upper member 2. In addition to this configuration, a hole or the like can be employed.

The inner wall of the lower member 3 is formed with a shoulder 25 (see Figs. 2 and 3), and the distal side of the inner wall 26 is relatively higher from the shoulder



as a boundary. On the proximal side from the shoulder, there are provided a pair of sidewalls 33, and a space enclosed by these sidewalls 33 serves as an storing space 32 for the needle and the hub. When the wing is introduced deep inside the clamp for the winged needle, the needle and the hub drop into the storing space 32 to be stored. It is also possible to provide a slit 34 on the sidewalls 33 to make them flexible so that the wing can easily be introduced.

The distal ends of the upper member 2 and the lower member 3 are rounded so that the wing can easily be introduced.

In the winged needle of the present invention, it is also possible to provide a mechanism that makes the upper member 2 and lower member 3 unreleasable once engaged with the needle and hub stored.

The usage of the clamp for the winged needle shown in Fig. 1 will now be described with reference to Fig. 2 to Fig. 5.

As shown in Fig. 2, the clamp for the winged needle of the present invention is disposed on the tube 44 of

the winged needle 4 in a state in which the engaging hooks 21 and the engaged portion 31 are not engaged.

Initially, the needle 41 of the winged needle 4 is  
5 pricked into the tissue of a human's skin so that the  
tube 44 is filled with blood, and then the engaging hooks  
21 and the engaged portion 31 of the clamp for the winged  
needle are engaged as shown in Fig. 3. At this time, the  
tube 44 is pressurized by the pressurizing portion 22  
10 and blocked.

Then, the blood circuit (not shown) is connected  
to the tube 44, and consequently, the engagement between  
the engaging hooks 21 and the engaged portion 31 is released  
15 to carry out hemodialysis.

When hemodialysis is completed, the needle 41 is  
withdrawn from the tissue of the human's skin and the  
blood circuit is removed from the tube 44.

20 As a last procedure, as shown in Fig. 4, the wing  
43 of the winged needle 4 is introduced into the clamp  
for the winged needle and slid to the position where the  
needle 41 and the hub 42 are stored in the storing space  
25 32, and then the engaging hooks 21 and the engaged portion

31 are engaged as shown in Fig. 5. At this moment, the  
hub 42 is fixed by the hub fixing means 23.

As described above, according to the present  
5 invention, the function as a protector and the function  
as a clamp can be provided simultaneously by a single  
member, the construction can be simplified and thus the  
workload of medical personnel is lightened.